

In the Specification

Please replace the Description of the Drawings with the following:

Description of the Drawings

Figure 1 is a perspective view of a first embodiment of the safety syringe illustrating the needle shield in a first, closed position and in a second, open position;

Figure 2 is a detailed perspective view of the **Figure 1** embodiment illustrating the means for securing the needle shield;

Figure 3 is a perspective view of the **Figure 1** embodiment illustrating the means for moving the needle shield from the first position to the second position;

Figure 4 is a perspective view of the **Figure 1** embodiment illustrating the means for securing the needle shield in the first position and the second position;

Figure 5 is a perspective view of the **Figure 1** embodiment illustrating the sealable membrane preventing fluids from leaking from the needle shield;

Figure 6 is a perspective view of a second embodiment of the safety syringe illustrating the needle shield in a first, closed position and in a second, open position; and

Figure 7 is a perspective view of the **Figure 2** embodiment of the safety syringe illustrating the mating lips of the needle shield in a first, closed position and in a second, open position.

Please replace the Detailed Description of the Preferred Embodiment with the following:

Detailed Description of the Preferred Embodiment

As shown in **Figure 1**, a safety syringe **10** may be constructed from the following components. A hollow body **14** is provided. The body **14** is of a first predetermined length **18**

and has an outer surface 22, a first end 26, a second end 30, cylindrical bore 34 of a first predetermined diameter 38. Means 42 are provided for gripping the hollow body 14 adjacent the second end 30. The first end 26 of the hollow body 14 includes an opening 46 of the first predetermined diameter 50. The second end 30 includes a cavity 54 extending from the cylindrical bore 34 and terminating in an outlet portion 58. The outlet portion 58 has a first end 62, a center section 66 and a second end 70 and is fixedly attached at its first end 62 to the cavity 54. The outlet portion 58 includes an orifice 74 of a second predetermined diameter 78 that extends outward from the cavity 54.

B2
A hollow needle 82 is provided. The needle 82 has a first end 86 and a second end 90 and is fixedly attached at its first end 86 to the second end 70 of the outlet portion 58 such that fluid 162 (not shown) may travel from the cylindrical bore 34, through the cavity 54, through the outlet portion 58 and through the needle 82. A plunger 94 is provided. The plunger 94 has a longitudinal shaft 98 longer than the first predetermined length 18, a first end 102 and a second end 106 (not shown), a thumb pad 110 fixedly attached to the first end 102 of the shaft 98, and a piston (not shown) 114. The piston 114 (not shown) is formed of a resilient material 118 (not shown), attached to the second end 106 (not shown) of the shaft 98, and is sized and shaped to fit sealably within the cylindrical bore 34 of the hollow body 14.

A needle shield 122 is provided. The shield 122 has an outer surface 126, a first end 130, a second end 134, and is sized and shaped to fit slidably over the needle 82 and at least a portion of the hollow body 14 of the syringe 10. Means 138 are provided for securing the needle shield 122 at its first end 26 to the hollow body 14 in a first position 142. The first position 142 permits the second end 90 of the needle 82 to extend outwardly from the second end 134 of the shield 122. A second position 146 permits the second end 134 of the needle shield 122 to extend

beyond the second end **90** of the needle **82**. Means **150** are provided for moving the needle shield **122** from the first position **142** to the second position **146** using a single hand **154** (not shown). Means **158** are provided for containing any fluid leaking **166** (not shown) from the second end **90** of the needle **82** within the needle shield **122** when the shield **122** is secured to the hollow body **14** in the second position **146**.

B₂ In a variant of the invention, as shown in **Figure 2**, the means **170** for securing the needle shield **122** at its first end **130** to the hollow body **14** in first **142** and second positions **146** further includes a first surrounding groove **174**. The first groove **174** is located on the outer surface **22** of the hollow body **14** adjacent its second end **30**. A second surrounding groove **178** is provided. The second groove **178** is located on the outer surface **22** of the hollow body **14** adjacent its first end **26**. An engaging finger **182** is provided. The finger **182** is formed of resilient material **186** and has an upper surface **190**, a lower surface **194**, an activating end **198**, an attaching end **202** and a pivot point **206** located between the ends. A securing tooth **210** is provided. The tooth **210** has an upper end **214** and a lower end **218** and is fixedly attached at its upper end **214** to the lower surface **194** of the engaging finger **182** adjacent the attaching end **202**. The securing tooth **210** is sized, shaped and located to removably engage one of the first **174** and second surrounding grooves **178** on the hollow body **14**.

A mounting post **226** is provided. The post **226** has an upper end **230**, a lower end **234** and is fixedly mounted at its lower end **234** to the outer surface **126** of the needle shield **122** adjacent its first end **130**. The post **226** is fixedly attached at its upper end **230** to the lower surface **194** of the engaging finger **182** at the pivot point **206** such that the resilient material **186** of the engaging finger **182** will bias the securing tooth **210** downward to removably engage one of the first **174** and second surrounding grooves **178**. When pressure is applied to the upper

surface **190** of the engaging finger **182** adjacent its activating end **198** the securing tooth **210** will pivot upwardly away from one of the first **174** and second securing grooves **178**, permitting the needle shield **122** to move slidably from the first position **142** to the second position **146**. When the securing tooth **210** is positioned over one of the first **174** and second securing grooves **178** and pressure is relieved from the upper surface **190** of the engaging finger **182** the securing tooth **210** will engage one of the grooves, preventing further movement of the needle shield **122**.

In yet another variant, as shown in **Figure 3**, the means **236** for moving the needle shield **122** from the first position **142** to the second position **146** using a single hand **154** (not shown) further comprises an indentation **238** located on the outer surface **126** of the needle shield **122** adjacent its first end **130** and is sized and shaped to engage a finger pad **242** (not shown) of a user.

P2 In still a further variant of the invention, as shown in **Figure 4**, the means **246 252** for containing any fluid leaking **166** from the second end **90** of the needle **82** within the needle shield **122** when the shield **122** is secured to the hollow body **14** in the second position **146** includes a sealing membrane **250 256**. The membrane **250 256** is fixedly attached to the second end **134** of the needle shield **122** and permits the hollow needle **82** and the second end **70** and center section **66** of the outlet portion **58** to pass through the membrane **250** when the needle shield **122** is in the first position **142**. The sealing membrane **250 256** is capable of sealing the second end **134** of the needle shield **122** when the shield **122** is in the second position **146** with the hollow needle **82** and outlet portion **58** withdrawn within the shield **122**.

In another variant, as shown in **Figure 5**, the means **252** for containing any fluid leaking **166** from the second end **90** of the needle **82** within the needle shield **122** when the shield **122** is secured to the hollow body **14** in the second position **146** includes a sealing membrane **256**. The

membrane 256 is fixedly attached to the second end 134 of the needle shield 122 and permits the hollow needle 82 to pass through the membrane 256 when the needle shield 122 is in the first position 142. The sealing membrane 256 is capable of sealing the second end 134 of the needle shield 122 when the shield 122 is in the second position 146 with the hollow needle 82 withdrawn within the shield 122.

B2 In still another variant of the invention, as shown in **Figure 6**, the needle shield 122 is formed of a resilient material 254 and the means 258 for containing any fluid leaking 166 from the second end 90 of the needle 82 within the needle shield 122 when the shield 122 is secured to the hollow body 14 in the second position 146 includes a flattened closure means 262 formed at the second end 134 of the needle shield 122. The closure means 262 has a pair of mating lips 266 at the second end 134 permitting the hollow needle 82 and the second end 70 and center section 66 of the outlet portion 58 to pass between them when the needle shield 122 is in the first position 142. The lips 266 are capable of sealing the second end 134 of the needle shield 122 when the shield 122 is in the second position 146 with the hollow needle 82 and outlet portion 58 withdrawn within the shield 122.

In a further variant, as shown in **Figure 7**, the needle shield 122 is formed of a resilient material 254 and the means 270 for containing any fluid leaking 166 from the second end 90 of the needle 82 within the needle shield 122 when the shield 122 is secured to the hollow body 14 in the second position 146 includes a flattened closure means 264 formed at the second end 134 of the needle shield 122. The closure means 264 has a pair of mating lips 268 at the second end 134 permitting the hollow needle 82 to pass between them when the needle shield 122 is in the first position 142. The lips 268 are capable of sealing the second end 134 of the needle shield

122 when the shield **122** is in the second position **146** with the hollow needle **82** withdrawn within the shield **122**.

In still a further variant of the invention, as shown in **Figure 8**, a safety infusion set **274** includes a length of flexible tubing **278** having a first end **282** and a second end **286**. A hollow catheter body **290** is provided. The body **290** has a first end **294**, a second end **298**, an outer surface **302** and an outlet portion **306**, and is fixedly attached at its first end **294** to the first end **282** of the tubing **278**. A pair of attachment wings **308** is provided. The attachment wings **308** are fixedly attached to the outer surface **302** of the catheter body **290**. The outlet portion **306** has a first end **310**, a center section **314** and a second end **318** and is fixedly attached at its first end **310** to the second end **298** of the catheter body **290**. A connection fitting **322** attached to the second end **286** of the tubing **278**. A hollow needle **324** is provided. The needle **324** has a first end **328** and a second end **332** and is fixedly attached at its first end **328** to the second end **318** of the outlet portion **306** such that fluid **336** may pass from the flexible tubing **278**, through the catheter body **290** and the outlet portion **306** and outwardly through the hollow needle **324**.

A needle shield **340** is provided. The shield **340** has an outer surface **344**, a first end **348**, a second end **352**, and is sized and shaped to fit slidably over the needle **324**, outlet portion **306**, and at least a portion of the catheter body **290**. The needle shield **340** has a cylindrical portion **342** beginning at the second end **352** of the shield **340**. The cylindrical portion **342** has an outer end **346** and an inner end **350** and is sized and shaped to fit over the outlet portion **306**, and a slotted portion **354**. The slotted portion **354** has a longitudinal slot **358**, extending from the inner end **350** of the cylindrical portion **342** toward the first end **348** of the shield **340**. The slotted portion **354** is sized and shaped to fit slidably over the hollow catheter body **290** with the slot **354** accommodating an intersection of the wings **308** and the catheter body **290**.

Means 355 are provided for securing the needle shield 340 at its first end 348 to the catheter body 290 in a first position 356. The first position 356 permits the second end 332 of the needle 324 to extend outwardly from the second end 352 of the shield 340. A second position 360 permits the second end 352 of the needle shield 340 to extend beyond the second end 332 of the needle 324. Means 364 are provided for moving the needle shield 340 from the first position 356 to the second position 360 using a single hand 368 (not shown). Means 372 are provided for containing any fluid leaking 376 from the second end 332 of the needle 324 within the needle shield 340 when the shield 340 is secured to the catheter body 290 in the second position 360.

B2 In yet another variant, as shown in Figure 9, the means 380 for securing the needle shield 340 at its first end 348 to the catheter body 290 in first 356 and second positions 360 includes a first surrounding groove 384. The first groove 384 is located on the outer surface 302 of the catheter body 290 adjacent its second end 298. A second surrounding groove 388 is provided. The second groove 388 is located on the outer surface 302 of the catheter body 290 adjacent its first end 294. An engaging finger 392 is provided. The finger 392 is formed of resilient material 396 and has an upper surface 400, a lower surface 406, an activating end 410, an attaching end 414 and a pivot point 418 located between the ends. A securing tooth 422 is provided. The tooth 422 has an upper end 426 and a lower end 430 and is fixedly attached at its upper end 426 to the lower surface 406 of the engaging finger 392 adjacent the attaching end 414.

The securing tooth 422 is sized, shaped and located to removably engage one of the first 384 and second surrounding grooves 388 on the catheter body 290. A mounting post 434 is provided. The post 434 has an upper end 438, a lower end 442 and is fixedly mounted at its lower end 442 to the outer surface 344 of the needle shield 340 adjacent its first end 348. The post 434 is fixedly attached at its upper end 438 to the lower surface 406 of the engaging finger

392 at the pivot point **418** such that the resilient material **396** of the engagement finger **392** will bias the securing tooth **422** downwardly to removably engage one of the first **384** and second surrounding grooves **388**.

When pressure is applied to the upper surface **400** of the engaging finger **392** adjacent its activating end **410** the securing tooth **422** will pivot upwardly away from one of the first **384** and second securing grooves **388**, permitting the needle shield **340** to move slidably from the first position **356** to the second position **360**. When the securing tooth **422** is positioned over one of the first **384** and second securing grooves **388** and pressure is relieved from the upper surface **400** of the engaging finger **392** the securing tooth **422** will engage one of the grooves, preventing further movement of the needle shield **340**.

B2 In still a further variant, as shown in **Figure 10**, the means **446** for moving the needle shield **340** from the first position **356** to the second position **360** using a single hand **450** (not shown) further includes an indentation **454**. The indentation **454** is located upon the outer surface **344** of the needle shield **340** adjacent its first end **348** and is sized and shaped to engage a finger pad **458** (not shown) of a user.

In yet another variant of the invention, as shown in **Figure 8**, the means **462** for containing any fluid leaking **376** from the second end **332** of the needle **324** within the needle shield **340** when the shield **340** is secured to the catheter body **290** in the second position **360** includes a first sealing membrane **466**. The membrane **466** is fixedly attached to the outer end **346** of the cylindrical portion **342** of the needle shield **340** and permits the hollow needle **324** and the second end **318** and center section **314** of the outlet portion **306** to pass through the membrane **466** when the needle shield **340** is in the first position **356**. A second sealing membrane **470** is provided. The second membrane **470** is fixedly attached to the inner end **350** of the cylindrical


portion 342 of the needle shield 340 and permits the hollow needle 324 and the second end 318 and center section 314 of the outlet portion 306 to pass through the membrane 470 when the needle shield 340 is in the first position 356. The first sealing membrane 466 is capable of sealing the outer end 346 of the cylindrical portion 342 of the needle shield 340 when the shield 340 is in the second position 360 with the hollow needle 324 positioned within the cylindrical portion 342. The second sealing membrane 470 is capable of sealing the inner end 350 of the cylindrical portion 342 of the needle shield 340 about the needle 324 when the shield 340 is in the second position 360 with the outlet portion 306 positioned within the slotted portion 354 of the shield 340.

P2 In still a further variant, as shown in Figure 10, the means 472 for containing any fluid leaking 376 from the second end 332 of the needle 324 within the needle shield 340 when the shield 340 is secured to the catheter body 290 in the second position 360 includes a first sealing membrane 466. The first membrane 466 is fixedly attached to the outer end 346 of the cylindrical portion 342 of the needle shield 340 and permits the hollow needle 324 to pass through the membrane 466 when the needle shield 340 is in the first position 356. A second sealing membrane 470 is provided. The second membrane 470 is fixedly attached to the inner end 350 of the cylindrical portion 342 of the needle shield 340 and permits the hollow needle 324 to pass through the membrane 470 when the needle shield 340 is in the first position 356. The first sealing membrane 466 is capable of sealing the outer end 346 of the cylindrical portion 342 of the needle shield 340 when the shield 340 is in the second position 360 with the hollow needle 324 positioned within the cylindrical portion 342. The second sealing membrane 470 is capable of sealing the inner end 350 of the cylindrical portion 342 of the needle shield 340 about the

needle 324 when the shield 340 is in the second position 360 with the outlet portion 306 positioned within the slotted portion 354 of the shield 340.

In yet another variant, as shown in **Figure 11**, the needle shield 340 is formed of a resilient material 478 and the means 482 for containing any fluid leaking 376 from the second end 332 of the needle 324 within the needle shield 340 when the shield 340 is secured to the catheter body 290 in the second position 360 includes a flattened closure means 486 formed at the outer end 346 of the cylindrical portion 342 of the needle shield 340. The closure means 486 has a pair of mating lips 490 at the outer end 346 permitting the hollow needle 324 and the second end 318 and center section 314 of the outlet portion 306 to pass between them when the needle shield 340 is in the first position 356. A sealing membrane 480 is provided. The membrane 480 is fixedly attached to the inner end 350 of the cylindrical portion 342 of the needle shield 340 and permits the hollow needle 324 and the second end 318 and center section 314 of the outlet portion 306 to pass through the membrane 480 when the needle shield 340 is in the first position 356. The lips 490 are capable of sealing the outer end 346 of the cylindrical portion 342 of the needle shield 340 when the shield 340 is in the second position 360 with the hollow needle 324 positioned within the cylindrical portion 342. The sealing membrane 480 is capable of sealing the inner end 350 of the cylindrical portion 342 of the needle shield 340 about the needle 324 when the shield 340 is in the second position 360 with the outlet portion 306 positioned within the slotted portion 354 of the shield 340.

In a final variant, as shown in **Figure 12**, the needle shield 340 is formed of a resilient material 498 and the means 502 for containing any fluid leaking 376 from the second end 332 of the needle 324 within the needle shield 340 when the shield 340 is secured to the catheter body 290 in the second position 360 includes a flattened closure means 506 formed at the outer end

346 of the cylindrical portion 342 of the needle shield 340. The closure means 506 has a pair of mating lips 510 at the outer end 346 permitting the hollow needle 324 to pass between them when the needle shield 340 is in the first position 356. A sealing membrane 488 is provided. The membrane 488 is fixedly attached to the inner end 350 of the cylindrical portion 342 of the needle shield 340 and permits the hollow needle 324 to pass through the membrane 488 when the needle shield 340 is in the first position 356. The lips 510 are capable of sealing the outer end 346 of the cylindrical portion 342 of the needle shield 340 when the shield 340 is in the second position 360 with the hollow needle 324 positioned within the cylindrical portion 342. The  sealing membrane 488 is capable of sealing the inner end 350 of the cylindrical portion 342 of the needle shield 340 about the needle 324 when the shield 340 is in the second position 360 with the outlet portion 306 positioned within the slotted portion 354 of the shield 340.

The safety syringe/catheter 10 has been described with reference to particular embodiments. Other modifications and enhancements can be made without departing from the spirit and scope of the claims that follow.
